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ABSTRACT

Rural special education teachers frequently are distant from information resources found in large urban libraries and universities, and do not have easy access to professional support or consultants' expertise. Telecommunications offers new sources of support to these teachers by permitting them to send and receive electronic mail messages, take part in electronic conferencing, access special interest groups and bulletin boards, and retrieve information from on-line databases. However, few teachers, particularly those in smaller school systems, have the skills necessary to use this new technology. In addition, teachers in isolated settings have difficulty accessing traditional training sources. This paper describes a structured teacher training module that can be used by rural teachers, individually or in staff development workshops. Rather than teaching computer and telecommunications skills as an isolated subject, this module focuses on integrating all skills into the curriculum and relating their uses to the special education classroom. Its step-by-step structure allows each trainee to interact independently with the technology. Module sections cover telecommunications hardware, software, barriers to implementation in the school, and integration in content areas. Sample activities illustrate the use of E-mail, Internet resources, on-line library services, and bulletin boards. (Contains 21 references.) (SV)

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REACHING OUT TO THE WORLD: TRAINING TEACHERS TO INTEGRATE TELECOMMUNICATIONS INTO SPECIAL EDUCATION CLASSROOMS

Introduction

Telecommunication offers new opportunities for special education teachers and their students by providing a network of informational resources that open up a world with which to communicate. This technology can be utilized both in professionally networking with others, and in providing exciting activities for their students. These educational uses of telecommunications can enable teachers to overcome a variety of barriers that they face in providing appropriate and motivating services.

Because telecommunications is a relatively new use of computers in the schools, few teachers have developed the skills required to make effective use of this new technology. In order to meet this need for continuing professional development, teacher training needs to be provided for developing skills in telecommunications and its integration into the special education curriculum. Training can be delivered through formal coursework at universities or through more informal staff development workshops or in-services. Rural schools need to explore alternative means of providing this training.

Teacher training needs to include basic technical information related to telecommunications hardware, software, logistics of implementation, and applications in content areas and suggested instructional activities. Teachers and teacher educators need to become better informed about the variety of possible uses of telecommunications in special education classrooms and the rationale for their use. These teacher training materials need to be based on the philosophy that computer technology should not be taught as an isolated skill, but should be integrated as a tool across all content areas. Teacher training activities should serve as the model of this type of classroom teaching. Teacher training activites should make use of the computer as a tool to teach other skills; computer uses demonstrated during the training should be shown being integrated into a variety of different content areas.

In designing this training, special educators and teacher trainers need to develop an awareness and knowledge of: 1) the use of step-by-step teacher training materials that can be used in developing skills in individual professional development in isolated settings; 2) the educational potential of telecommunications across the curriculum; 3) the hardware and software aspects of telecommunications; and 4) Internet resources that can be utilized in special education classrooms.

Importance of Telecommunications in Rural Areas

Teachers in rural settings, such as West Virginia, frequently face both lack of resources and feelings of isolation. These teachers are distanced from informational resources found in large urban libraries or universities and do not have easy access to professional support or consultants' expertise. These teachers are usually the only special educators in their small schools; so they lack

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even the support of other special education professionals.

Telecommunications offer new sources of support to rural special education teachers and their students by providing a network of informational resources. Rural teachers can particularly benefit from using technology both to expand their professional network and to provide academic activities for their students. Collaborative class projects can be undertaken among classes in diverse sections of the world. Technology can help to reduce barriers of accessibility for students who are physically challenged.

Telecommunications permit teachers to send and receive electronic mail messages, take part in electronic conferencing, access special interest groups and bulletin boards, and retrieve information from data bases. Each of these telecommunication activities can be utilized either primarily for the professional use of the teacher or primarily for the support of educational activities of the students.

Telecommunications is a relatively new use of computers in schools and few teachers, particularly those in smaller school systems, have developed the necessary skills to utilize this new technology. Training can be provided through university courses, as well as district-wide staff development workshops or in-services, but teachers in isolated settings will have difficulty accessing these traditional training sources.. Rural schools need to examine options for alternative methods of training by utilizing structured training modules that can be used by individuals or small groups.

Teacher Training Module

A teacher training module was developed for use in a graduate level class, "Computer Applications in Special Education." However, these training activities could be readily utilized in other types of training formats. This step-by-step lab guide could be easily utilized by teachers in rural settings for their own individual professional development or it could be used by a group of teachers working together in a small group for an informal staff in-service or workshop. The emphasis of this entire course is placed on integrating all computer skills, including telecommunications, into the curriculum rather than teaching computer skills as an isolated subject such as in a computer literacy class.

In order to implement telecommunications activities in special education classrooms, teachers must develop general knowledge and specific technical skills in: 1) evaluating and obtaining the necessary hardware and software; 2) planning for implementing and overcoming the barriers in a school building; 3) developing the skills in using the hardware and software; and 4) generating ideas for integrating use in a variety of content areas. Any training developed must include activities that develop skills in each of these areas.

Theoretical Base

This teacher training module is based on the philosophy that skills should not be taught in isolation, but need to be related to their uses in a special education classroom. Philosophically, it is felt that teachers need to see an immediate application of the technology to their classroom setting, so a variety of curriculum applications need to be provided in which the hardware or software being taught can be utilized. Teachers will more readily accept the need to learn these new skills when their usefulness is readily demonstrated within the training activity.

This module was also based on the philosophy that computers are not taught as a separate subject, but as a tool to be utilized across all content areas. It needs to be emphasized that telecommunications lessons are not just a separate "fun" activity done in a computer class, but a

tool that can be utilized throughout the curriculum. Thus, as new technical skills are developed, their curriculum applications must be included, and uses need to be demonstrated across subject areas. Along with new computer skills, teachers also need to develop skills in planning lessons and integrating activities throughout all the content areas.

The structured lab guides are based on the philosophy that teachers need to view computers as being user friendly and that users need to have access to step-by-step instructions that will continue to be available after completing the training course. These training materials were designed with a step-by-step structure by task analyzing the computer activity and then field testing for use without further use of other documentation. They were designed so that students could be independently successful in their interactions with the technology. The step-by-step lab guides also allow teachers to continue to utilize them later in their schools. The directions need to be structured and condensed so that students can be successful in their use of these activities and that these lab guides can serve as future refence guides.

Each training activity incorporates and models aspects of curriculum integration as skills are taught about the use of telecommunications. Teacher training lessons need to provide the role model for how teachers can integrate computer technology into their own special education classrooms.

Telecommunications Hardware

Teachers need a general knowledge of the computer hardware utilized in telecommunications, an understanding of what problems might arise in setting up telecommunications in a school setting, and a skill in brainstorming ideas and problem solving how to overcome these barriers. To initiate a new technology project in a school, teachers need to have sufficient knowledge to guide the purchase of appropriate equipment and to respond to feasibility questions by administrators .

The hardware required to initiate a telecommunications project include a microcomputer, a dedicated telephone line, and a modem.

Teachers are not likely to know what a modem is and how to select the appropriate one to purchase. A modem connects a computer to standard phone lines. A modem allows two computers to communicate over phone lines and to act as if they were directly connected. A modem (short for modulator / demodulator) is a device that allows translation of computer data into an electronically transferrable signal along a telephone circuit. Modems can be purchased to be installed internally or to be attached externally. Modems transmit data at a speed measured by baud rate, which is the number of bits per second. A 2400-baud or a 9600-baud modem is the current choice of most users.

Telecommunications Software

Before beginning any new project using telecommunications, teachers need a general knowledge of the necessary computer software, an understanding of the system used to access its capabilities, and the technical skill in using all of this. This knowledge is needed to guide the purchase of appropriate communications software and to secure membership in an appropriate communications network. Teachers must be able to evaluate the classroom uses required and to identify the types of systems that can meet these needs.

Specialized software that allows the microcomputer to be converted into the "terminal mode" provides the set of computer instructions that determine how the computer should process the information it receives or transmits. The software can set up the autodial and autoanswer

capabilities of many modems, automatically dialing numbers the user has set in the memory of the program. The software can control functions such as communications protocols, data transfers, and command operations. Some allow the computer to save information on disk, letting information be saved for future reference. Text files can be retrieved and then modified using any word processor.

Besides the software, the user must subscribe to an information system, or network, (with or without cost) which provides an account number and password allowing access to the system. Many state educational agencies have developed state-wide computer information networks. Commercial systems, such as Prodigy or CompuServe, are also available.

As part of the training activities, a HyperCard simulation was created that allowed students to write a grant proposal to implement a telecommunications project in their school. A Resources section provided information on various modems and communications software along with prices that students could access in developing their proposed budget. Part of the grant proposal writing was to develop a budget along with a rationale for the hardware and software selected. In the project description students were to generate a section on implementation in their school (training needed, logistics, incorporation with existing technology, problems that might be encountered) as well as a section on integration into the curriculum.

Barriers to Implementing Telecommunications

Probably the most significant barrier in establishing telecommunications within a school is the need for a phone line. Options to explore are using the school's fax line, sharing of any special lines within the school (in West Virginia the state established a special line for the school lunch program so that daily counts could be transmitted), or placing a switch on regular phone lines. If these options are not possible, alternate access to a modem could be after school hours either from school, home, or at a business location.

In a recent study of telecommunications in K-12 schools (Honey and Henriquez, 1993), other barriers to effective use of telecommunications included lack of time in the school schedule, inadequate communication about telecommunications-related matters throughout the school system, lack of financial support, and inadequate district-level development of goals and plans for use of telecommunications.

As with the introduction of all new technologies, other problems include insufficient hardware (in this case, modems), inflexible scheduling or lack of access to equipment, and lack of administrative support for training and/or purchase of equipment.

Integration in Content Areas

Teachers need a general knowledge of the wide range of possibilities provided by telecommunications, an understanding of available services to enhance the learning of teachers and students, and specific technical skills in accessing appropriate ones. But, most importantly, teachers need to develop the philosophy of telecommunications as a tool to be integrated within content areas and not just as an end in itself.

Telecommunications activities are not just a separate activity done in a computer class, but a tool that can be utilized throughout the curriculum. While developing the technical skills of using the technology, teachers also need to develop skills in planning lessons and integrating activities throughout all the content areas.

Each of the training activities in this module incorporates and models aspects of curriculum

integration as skills are taught about the use of telecommunications. Examples of some activities include the following:

1. E-Mail Activity - Electronic Class Discussion of Journal Articles

Each pair of teachers is given a journal article that illustrates different uses of telecommunications in a variety of content areas. After reading and discussing their articles, each pair is to send a summary and several discussion questions as an electronic mail message to other members of the class. Specific steps for getting on to the system and sending an electronic mail message are outlined step-by-step in the lab guide. Other students ask questions about the article, to which the original sending pair can respond. The idea of "key pals" replacing the traditional "pen pals" can be introduced into the discussion. The advantages for special education students can be emphasized (neat appearance of typed message versus illegible handwriting, spell checkers, faster responses). Through either on-line or off-line discussions students should be focused on looking for activities, or modifications of activities, that they might make use of in their own classrooms.

2. Using Internet Resources - Math / Science / Social Studies Questions

Teachers are given directions on how to access the University of Michigan Weather Service and/or the Geographic Name Server through the Internet as an example of using telecommunications for information retrieval. A worksheet is provided using math, science or social studies oriented questions. Steps in the lab guide outline how to use an address to get to an Internet location and then suggest how to use the menu and submenus to locate answers. Teachers are then challenged to develop their own questions based on areas of math, science or social studies that they might teach with their own classes.

3. Using On-Line Library Services

Teachers are given directions for accessing Mountain Lynx, WVU's on-line library system. This could also be done by accessing ERIC on-line or with any of the CD-ROM encyclopedias. The lab guide challenges them to locate a book on the topic of using computers with children in the library system. The lab guide instructs students as to how to use key word and subject searches and then encourages them to try different search strategies for locating this information. Off-line students are placed in groups and asked to develop a lesson for teaching computer search strategies to their own students. Discussion is focused on the difficulties that students have in developing effective search strategies. On-line searches can only retrieve information if the user can make effective use of key word and subject searches.

4. Using a Bulletin Board

"Kidsphere" is an on-line bulletin board for K-12 educators. Students are shown how to access an account for this bulletin board and to read new messages that have arrived in order to demonstrate the wide variety of subjects covered. The lab guide outlines how to read and delete mail messages, to use the directory to see the subject headings of messages, to search for key topics, and to save text files. They are also given information about subscribing to this bulletin board. Students are challenged to locate one activity or idea that could be utilized in their own classroom and also to think of one collaborative project that they would send out to other teachers through this group.

Summary

Telecommunication can provide a means for overcoming the barriers of isolation and lack

of resources in rural special education classrooms. Telecommunication can be utilized both to support professional networking and student educational activities and projects.

Since the use of telecommunications technology is not an established practice within our special education classrooms, opportunities for teacher training need to develop these competencies and create the philosophy of utilizing this technology as a tool across all content areas. The special needs of teachers in isolated settings need to be considered and alternative delivery models of training need to be considered. Individuals, or small groups of teachers working together, can utilize a structured learning guide to develop these new skills.

Training materials, such as this module, need to be developed that would increase knowledge and skills in: 1) use of the hardware and software, as well as specific understandings of how to evaluate appropriateness because they might be involved in the purchase of new equipment; 2) problem solving skills to overcome barriers in establishing a new program in a school setting; and 3) specific technical knowledge and skill in accessing electronic resources, and in curriculum planning to integrate this new technology as a tool for expanding both professional knowledge and student learning.

Training materials need to provide step-by-step directions that are user friendly in order to insure success and that can be utilized for future reference after the training course is completed and teachers are back alone in their schools. Training materials need to demonstrate that telecommunications is not an end to itself but a tool that is used in all areas across the curriculum.

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